

U.S.S.N. 10,796,470

Claim Amendments

Please amend claims 1, 13, and 17 as follows

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Claims as Amended

1. (currently amended) An electrolyte for copper electroplating with improved wetting of a copper seed layer and improved deposition uniformity of said electroplated copper, comprising:

an electrolyte solution comprising a copper ion source; and

a suppressor additive copolymer comprising consisting of ethylene oxide and propylene oxide provided in said electrolyte solution;

an accelerator additive provided in said electrolyte solution;

wherein said suppressor additive is at a higher concentration than said accelerator additive.

2. (original) The electrolyte of claim 1 wherein said copolymer is a block copolymer.

3. (original) The electrolyte of claim 1 wherein said ethylene oxide is present in said copolymer in a quantity of at least

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about 60% by weight.

4. (original) The electrolyte of claim 1 wherein said copolymer is present in said electrolyte solution in a concentration of from about 50 ppm to about 500 ppm.

5. (original) The electrolyte of claim 1 wherein said copolymer is a random copolymer.

6. (original) The electrolyte of claim 5 wherein said ethylene oxide is present in said copolymer in a quantity of at least about 60% by weight.

7. (original) The electrolyte of claim 1 wherein said copolymer is an alternating copolymer.

8. (original) The electrolyte of claim 7 wherein said ethylene oxide is present in said copolymer in a quantity of at least about 60% by weight.

9. (original) The electrolyte of claim 1 wherein said ethylene oxide is present in said copolymer in a quantity of about 80% by weight and said propylene oxide is present in said copolymer in a

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quantity of about 20% by weight.

10. (original) The electrolyte of claim 9 wherein said copolymer is a block copolymer.

11. (original) The electrolyte of claim 9 wherein said copolymer is a random copolymer.

12. (original) The electrolyte of claim 9 wherein said copolymer is an alternating copolymer.

13. (currently amended) An electrolyte for copper electroplating with improved wetting of a copper seed layer and improved deposition uniformity of said electroplated copper, comprising:

an electrolyte solution comprising a copper ion source;

a suppressor additive copolymer comprising consisting of ethylene oxide and propylene oxide that is not a block copolymer provided in said electrolyte solution; and

a leveling agent provided in said electrolyte solution;

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an accelerator additive provided in said electrolyte solution;

wherein said suppressor additive is at a higher concentration than said accelerator additive.

14. (original) The electrolyte of claim 13 wherein said copolymer is ~~a block copolymer~~, selected from the group consisting of a random copolymer ~~or~~ and an alternating copolymer.

15. (original) The electrolyte of claim 13 wherein said ethylene oxide is present in said copolymer in a quantity of at least about 60% by weight.

16. (original) The electrolyte of claim 13 wherein said copolymer is present in said electrolyte solution in a concentration of from about 50 ppm to about 500 ppm.

17. (currently amended) A method of electroplating ~~a metal~~ copper on an electroplating surface comprising a copper seed layer to achieve improved wetting of said copper seed and improved deposition uniformity of said electroplated copper, comprising the steps of:

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providing an electroplating surface comprising a copper seed layer;

providing an electroplating bath solution comprising a source of copper ions;

mixing a suppressor additive copolymer comprising consisting of ethylene oxide and propylene oxide with said solution in a concentration of from about 50 ppm to about 500 ppm;

providing an accelerator additive in said electroplating bath solution at a concentration less than said suppressor additive;

immersing said electroplating surface comprising said copper seed layer in said solution to fully wet said copper seed layer;
and

electroplating said metal copper onto said electroplating surface.

18. (original) The method of claim 17 wherein said copolymer is a block copolymer, a random copolymer or an alternating copolymer.

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19. (original) The method of claim 17 wherein said ethylene oxide is present in said copolymer in a quantity of at least about 60% by weight.

20. (original) The method of claim 17 wherein said ethylene oxide is present in said copolymer in a quantity of about 80% by weight and said propylene oxide is present in said copolymer in a quantity of about 20% by weight.